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Hardy Weinberg Test Questions Practice

1. What does p represent?
2. What does q represent?
3. What does p2 represent?
4. What does 2pq represent?
5. What does q2 represent?
6. The data below demonstrate the frequency of tasters and nontasters of a certain compound in four isolated populations that are in Hardy-Weinberg equilibrium. The allele for nontasters is recessive. In which population is the frequency of the recessive allele highest?

Population Tasters Nontasters Size of Population

(A) 1 110 32 142

(B) 2 8,235 4,328 12,563

(C) 3 215 500 715

(D) 4 11,489 2,596 14,085

1. Some people have the ability to taste a bitter chemical called phenylthiocarbamide (PTC). The ability to taste PTC is due to the presence of at least one dominant allele for the PTC taste gene. The incidence of nontasters in North America is approximately 45%. Assuming the population is in Hardy-Weinberg equilibrium, what percent of the North American population is homozygous dominant for the ability to taste PTC? Provide your answer as a number between 0 and 1 to the nearest hundredth.
2. Ellis-van Creveld syndrome is a recessive genetic disorder that includes the characteristics of short stature and extra fingers or toes. In the general population, this syndrome occurs in approximately 1 in 150,000 live births. In a particular isolated population, however, the incidence of this syndrome among live births is 1 in 500.

Assume that both the isolated population and the general population are in Hardy-Weinberg equilibrium with respect to this syndrome. Which of the following best describes the difference between the frequency of the allele that causes the syndrome in the general population and the frequency of the allele in the isolated population?

(A) The frequency of the Ellis-van Creveld allele is 0.002 in the isolated population and 0.0000066 in the general population, which suggests that selection for this trait is occurring in both populations.

(B) The frequency of the Ellis-van Creveld allele is 0.0447 in the isolated population and 0.0026 in the general population, showing that the rate of genetic mutation is highest among individuals in the isolated population.

(C) The frequency of the Ellis-van Creveld allele is 0.002 in the isolated population and 0.0000066 in the general population, which demonstrates gametic incompatibility between the populations.

(D) The frequency of the Ellis-van Creveld allele is 0.0447 in the isolated population and 0.0026 in the general population, which suggests that genetic drift has occurred in the isolated population.